

Amendments to the Claims

This listing of claims replaces prior versions:

Claims 1-10 (Canceled)

Claim 11 (New): An image processing apparatus for performing correction, the image processing apparatus comprising:

a plurality of templates;

a window array conversion unit that converts a data array of output data from an $M \times N$ window extracted from input data to a plurality of array conversion data patterns;

a pattern collation unit that collates the array conversion data pattern converted by the window array conversion unit with at least one of the templates, each of the templates including reference patterns; and

a pattern collation control unit that switches between the array conversion data patterns to collate with the template,

wherein the pattern collation control unit selects at least one of the templates based on a combination of mark dots and space dots from among a current dot of interest and its neighboring dots in the output data from the window.

Claim 12 (New): The image processing apparatus according to claims 11, wherein the pattern collation control unit selects at least one of the templates based on a combination of mark dots and space dots from among the current dot of interest and its right and left neighboring dots in the output from the window.

Claim 13 (New): The image processing apparatus according to claim 11, wherein the pattern collation control unit extracts a center dot from an $M \times N$ dot array in a window from the input data as the current dot of interest, together with the right and left dots both neighboring the current dot of interest along with a direction of extraction which is the direction of image data collation.

Claim 14 (New): The image processing apparatus according to claim 11, wherein the combination includes:

(a) a first template group of a continuous pattern consisting of three dots entirely having mark, or space;

(b) a second template group of a discontinuous mark pattern consisting of the current dot of interest having mark, excluding the template group (a); and

(c) a third template group of a discontinuous space pattern consisting of the current dot of interest having space, excluding said template group (a).

Claim 15 (New): The image processing apparatus according to claim 14,

wherein the pattern collation control unit starts collation with the first template group when the current dot of interest and its right and left neighboring dots entirely have mark, or space;

the pattern collation control unit starts collation with the second template group when the current dot of interest has mark, and at least either its right or left neighboring dot has space; and

the pattern collation control unit starts collation with the third template group when the current dot of interest has space, and at least either its right or left neighboring dot has mark.

Claim 16 (New): An image forming apparatus comprising:

an image processing unit that extracts a window pattern having $M \times N$ dots from an input image;

a plurality of templates;

a window array conversion unit that converts a data array of the window pattern to a plurality of array conversion data patterns;

a pattern collation unit that collates the array conversion data pattern converted by the window array conversion unit with at least one of the templates, each of the templates having reference patterns;

a pattern collation control unit that switches between the array conversion data patterns to collate with the template; and

a pattern correction unit that corrects the window pattern based on a result by the pattern collation unit;

wherein the pattern collation control unit selects at least one of the templates based on a combination of mark dots and space dots from among the current dot of interest and neighboring dots in the window pattern.

Claim 17 (New): The image forming apparatus according to claim 16, wherein the image processing unit extracts the window pattern from bitmap data expanded from an input image.

Claim 18 (New): An image processing method for performing correction comprising:

converting a data array of output data from an $M \times N$ window extracted from input data to a plurality of array conversion data patterns;

collating the array conversion data pattern converted with at least one of a plurality of templates, each of the templates including reference patterns; and

switching between the array conversion data pattern to collate with the template,

wherein the template is selected based on a combination of mark dots and space dots from among a current dot of interest and its neighboring dots in the output data from the window.

Claim 19 (New): The image processing method according to claim 18, wherein a process of collating collates the array conversion data patterns with the templates by referencing patterns in a single direction.

Claim 20 (New): The image processing method according to claim 18, wherein a process of switching decides a center dot from an $M \times N$ dot array in a window from the input data as the current dot of interest, together with right and left dots both neighboring the current dot of interest along with a direction of extraction which is the direction of image data collation.

Claim 21 (New): The image processing method according to claim 18, wherein the combination includes:

(a) a first template group of a continuous pattern consisting of three dots entirely having mark, or space;

(b) a second template group of a discontinuous mark pattern consisting of the current dot of interest having mark, excluding the template group (a); and

(c) a third template group of a discontinuous space pattern consisting of the current dot of interest having space, excluding said template group (a).

Claim 22 (New): The image processing method according to claim 21,

wherein a process of the collating starts collation with the first template group when the current dot of interest and its right and left neighboring dots entirely have mark, or space;

the process of collating starts collation with the second template group when the current dot of interest has mark, and at least either its right or left neighboring dot has space; and

the process of collating starts collation with the third template group when the current dot of interest has space, and at least either its right or left neighboring dot has mark.

Claim 23 (New): A storage medium readable by a computer, the storage medium storing a program of instructions executable by the computer to perform a function for image processing, the function comprising:

converting a data array of output data from an $M \times N$ window extracted from input data to a plurality of array conversion data patterns;

collating the array conversion data pattern with at least one of a plurality of templates, each of the templates including reference patterns; and

switching between the array conversion data patterns to collate with the template,

wherein the template is selected based on a combination of mark dots and space dots from among a current dot of interest and its neighboring dots in the output data from the window.

Claim 24 (New): The image processing method according to claim 23, wherein a process of collating collates the array conversion data patterns with the templates by referencing patterns in a single direction.

Claim 25 (New): The image processing method according to claim 23, wherein a process of switching decides a center dot from an $M \times N$ dot array in a window from the input data as the current dot of interest, together with right and left dots both neighboring the current dot of interest along with a direction of extraction which is the direction of image data collation.

Claim 26 (New): The image processing method according to claim 23, wherein the combination includes:

(a) a first template group of a continuous pattern consisting of three dots, entirely having mark, or space;

(b) a second template group of a discontinuous mark pattern consisting of the current dot of interest having mark, excluding the template group (a); and

(c) a third template group of a discontinuous space pattern consisting of the current dot of interest having space, excluding said template group (a).

Claim 27 (New): The processing method according to claim 26,

wherein a process of collating starts collation with the first template group when the current dot of interest and its right and left neighboring dots entirely have mark or space;

the process of collating starts collation with the second template group when the current dot of interest has mark, and at least either its right or left neighboring dot has space; and

the process of collating starts collation with the third template group when the current dot of interest has space, and at least either its right or left neighboring dot has mark.

Claim 28 (New): The image processing apparatus according to claim 11, wherein the pattern collation unit collates the array conversion data patterns with the templates by referencing patterns in a single direction.

Claim 29 (New): The image processing apparatus according to claim 11, wherein the pattern collation control unit switches between the array conversion data patterns to collate with the template based on a time-division.

Claim 30 (New): The image processing apparatus for performing correction, the image processing apparatus comprising:

- a plurality of templates;

- a window array conversion unit that converts a data array of output data from an $M \times N$ window extracted from input data to a plurality of array conversion data patterns;

- a pattern collation unit that collates the array conversion data pattern converted by the window array conversion unit with at least one of the templates, each of the templates including reference patterns; and

- a pattern collation control unit that switches between the array conversion data patterns to collate with the template based on a time-division and selects at least one of the templates based on a combination of mark dots and space dots from among a current dot of interest and its neighboring dots in the output data from the window, wherein the combination includes

- (a) a first template group of a continuous mark pattern consisting of three dots entirely having mark, or space;

(b) a second template group of a discontinuous mark pattern consisting of the current dot of interest having mark, excluding the template group (a); and

(c) third template group of a discontinuous space pattern consisting of the current dot of interest having space, excluding said template group (a), and the plurality of templates being classified by the template groups and a plurality of process of the pattern collation unit being performed in parallel based on the template groups.